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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,978	02/27/2002	William P. Platt	H0002988	6889

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EXAMINER

AHMED, SHAMIM

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 10/14/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,978

Applicant(s)

PLATT ET AL.

Examiner

Shamim Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 31-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-30, drawn to a process, classified in class 216, subclass 33.
 - II. Claims 31-46, drawn to a product, classified in class 137, subclass 859.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by different process such as one wherein, depositing the first and the second layer on a first mating surface and then bonded with the second mating surface or by brazing process.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Joseph Herndon on 9/23/03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-30.

Affirmation of this election must be made by applicant in replying to this Office action.

Claims 31-46 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1,3, 6-9,13-16,18, 24-28, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 2001/0021570 A1) in view of Williams (4,930,001).

As to claims 1, 15-16 and 30, Lin et al disclose a process of bonding members of a micro electro mechanical system (MEMS), wherein depositing a first layer of gold (Au)

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is deposited on a first mating surface such as pyrex glass cap layer and a second layer of indium deposited on a second mating surface of silicon substrate (see paragraph 0072 at page 8).

Lin et al also disclose that pressing the first and second mating surfaces by applying sufficient pressure to form a bonding between the mating surfaces by forming an intermediate layer at sufficient temperature (see the paragraph 0072 at page 8 and also the figure 14b).

Lin et al do not explicitly teach that the intermediate layer formed by pressing the first and second material is an alloy.

However, Williams discloses a process of bonding a first layer of material such as gold (16) with a second layer of material such as indium (11) by pressing the first material layer onto the second material layer for a period of time to form an alloy to form a high strength bond between surfaces during integrated circuit processing (col.3, lines 3-21 and figures 3-4).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to employ Williams' s teaching into Lin et al's bonding process for providing a high strength alloy bonding between two members of gold and indium as taught by Williams.

As to claims 3 and 18, Lin et al silent about the claimed temperature is in the range of 20 to about 200 degree C.

However, Williams teaches that the pressing the two layers at a temperature of about 100 degree C, which is sufficient to diffuse the gold into the indium in order to form a diffusion bonding (col.3, lines 6-11).

So, it would have been obvious to one skilled in the art at the time of claimed invention to employ Williams teaching of pressing the mating surfaces at about 100 degree C into Lin et al's process for providing a stronger bonding as taught by Williams.

As to claims, 6 and 24, Williams teaches that the thickness of the gold layer (16) is in the range of 1000-5000 Angstroms, which includes the claimed range 100 angstroms to about 0.25 inches (col.2, lines 52-53).

As to claims 7 and 25, Williams teaches that the thickness of the indium layer as the second layer is about 1-9 microns, which includes the claimed range 50 angstroms to about 0.125 inches (col.2, lines 48-49).

As to claims 8-9, and 26-27, Lin et al teach that the members to be joined comprises an encapsulating or covering layer, which can be silicon or glass material (see paragraph 001 and figure 14b).

As to claims 13 and 28, Lin et al teach that depositing a first and second layer of mating material such as chromium (Cr) before depositing the first and the second material layer (see the figure 14b).

9. Claims 2 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over over Lin et al (US 2001/0021570 A1) in view of Williams (4,930,001) and further in view of Waelti (EP 000981159).

Modified Lin et al discussed above in the paragraph 8 and also discloses that the stronger bonding is formed by diffusing one component to another as a result of sufficient pressure and temperature, wherein the temperature is in between the melting points of the component such as gold (mp 1063 degree C) and indium (mp 156 degree C) (col.3, lines 3-14 of Williams).

Modified Lin et al do not explicitly teach that the bonding process includes a solid-liquid Inter Diffusion (SLID) bonding process.

However, it would have been obvious that modified Lin et al's process include the SLID bonding process because diffusion of metal component occurs at sufficient pressure and temperature, which is in between the boiling point of the mating metal components that leads to a solid-liquid inter diffusion bonding as supported by Waelti.

Waelti teaches gold and indium are joined together with a temperature between the melting points of both components to form a solid-liquid inter diffusion bonding (see the abstract).

10. Claims 4-5,10-12,19-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 2001/0021570 A1) in view of Williams (4,930,001) and further in view of Stacher (5,118,026).

Modified Lin et al discussed above in the paragraph 8 but fails to disclose the claimed pressure, temperature and duration of bonding.

However, in a method of solid state diffusion bonding between metals, Stacher teaches that actual times, pressure and temperature for the bonding process will vary metal to metal in order to form stronger bonding (col.2, lines 39-68).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to optimize the result effective variables such as time, pressure and temperature in order to form stronger bonding between the metals as taught by Stacher.

11. Claims 14 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 2001/0021570 A1) in view of Williams (4,930,001) and further in view Eberle et al (6,049,958).

Modified Lin et al discussed above in the paragraph 8 but remain silent about the thickness of the chromium layer.

However, in a method of depositing conductive layer such as gold (Au) onto a substrate, Eberle et al teach that a thin adhesion layer of chromium layer, typically of 50-100 angstroms thick is deposited followed by the deposition of the gold layer (col.11, lines 16-21).

Therefore, it would have been obvious to one skilled in the art at the time of claimed invention to employ Eberle et al's teaching of having the thickness of the chromium layer in the range of 50-100 angstroms into modified Lin et al's process for promoting the adhesion capability between the substrate and the gold layer as taught by Eberle et al.

Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 1, 3, 16 and 18 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,234,378. Although the conflicting claims are not identical, they are not patentably distinct from each other because MEMS of the instant application broadly includes a laser gyroscope of the patent 6,234,378 and the temperature range of about 20 to about 200 degree C includes the temperature range of approximately 40 to 90 degree C of the patent 6,234,378.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (703) 305-1929. The examiner can normally be reached on M-Thu (7:00-5:30) Every Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G Norton can be reached on (703) 305-2667. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Shamim Ahmed
Examiner
Art Unit 1765

SA
October 1, 2003